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ALPHABETICAL AND ANALYTICAL

INDEX

WM. R. CHEDSEY

TRANSACTIONS OF THE
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ENGINEERS
//

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PREFACE.

The present work, containing in rearranged and condensed form the indexes of the *Transactions*, Volumes XXXVI to XL, inclusive, is of special value in that it supplements the General Alphabetical and Analytical Index of Volumes I to XXXV, and, by giving all of the new material contained in the technical and professional papers which have been contributed to the Institute during the past five years, brings the index of all the volumes so far published fully up to the date of the last issue, June, 1910. An improvement has been made in the new arrangement of the material under group-headings, which, by presenting the references in tabular form, will enable the reader to find a given item more readily than in the former compact arrangement.

Taken together these two indexes furnish in convenient form for ready reference everything of importance contained in the *Transactions*, and give to both member and non-member, whether possessing a set of the *Transactions* or not, the means of ascertaining at a minimum expenditure of time and trouble the exact contents of the volumes on any given subject of special interest.

JOSEPH STRUTHERS,

Assistant Secretary and Editor.

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ERRATA.

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Page.	Line.	
155	29	For "Joachimstahl," read "Joachimsthal."
215	Foot-note ² .	For "May, 1892," read "May, 1902."
216	21	For "ack-screw," read "jack-screw."

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31	3	For "quantity of tons," read "quantity of slimes."
35	10	Expunge "recorded in Table VII."
37	24	Expunge "to."
38	33	For "page 89," read "page 9."
44	40	For "page 86," read "page 6."
47		In table, third line under heading "Excavators and Conveyors," expunge "per 40 ft. of."
52		Second line under table. For "32," read "0.32."
90	16	For "Sargent," read "Sergeant."
147		Fig. 2, title. For "White Horse Claim," read "Wild Horse Claim."
154	19	For "porlarizing," read "polarizing."
173	35	For "character," read "characteristics."
178		Under title, add "(Bethlehem Meeting, February, 1906.)"
212		Table VII., second line. For "1.5," read "1.0."
389		Footnote ¹ , fifth line. For "unworked," read "worked."
441		In place of paragraphs (9) and (10) read: " (9) Two Harz jigs on 1.25-in. feed. Concentrates to (12), middlings to (13) through (11), (7), (8), hutch-product to (14). " (10) Four Harz jigs on 7/8-in. feed. Concentrates to (12), middlings to (16) through (15), (7), (8), (13), hutch-product to (14)." Paragraphs (14), (17) and (19). For "(35)," read "(20)."
442		Paragraphs (27), (30) and (33). After "(32)," add "through (31)."
526	16	For "mustin," read "Austin."

VOL. XXXVIII.

406	2	For "Aug. 23," read "Aug. 22."
409	25	For "December, 1902," read "Apr. 24, 1902."
811	Last.	For "vanadine," read "vanadium."
813	First.	For "Vanadine," read "Vanadium."

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	Footnote ⁴ .	For "p. 478," read "p. 400."
80	1	For "3 tons," read "5 tons."
82	6	For "small," read "large."
89	27-32	Omit entire paragraph.
93	18	After word "ore," omit remainder of line, and lines 19 to 21.
303	1	For "Cobalt," read "Toronto."
307	Next to last.	For "28 oz. 1 dwt. of gold," read "28 oz. of silver and 1 dwt. of gold."
809	{	Footnotes ⁵ and ⁶ should read, " <i>Applied Science</i> (Transactions of the University of Toronto Engineering Society), New Series, vol. i., No. 3, p. 125 (Jan., 1908)."
811		

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- HOFMAN, H. O., HAYDEN, R., and HALLOWELL, H. B.: *A Study in Refining and Overpoling Electrolytic Copper*, XXXVII, [lxxiii]; XXXVIII, lii, 171-195.
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